

What is claimed is:

- 1) A process for reducing atherosclerotic plaques in a mammal comprising administering to said mammal a safe and effective amount of a lipid hydrolyzing protein or polypeptide, or mixtures thereof, sufficient to effect a reduction in the amount of atherosclerotic plaques in said mammal.
- 2) The process of claim 1 wherein said lipid hydrolyzing protein or polypeptide targets a receptor site for uptake into lysosomes.
- 3) The process of claim 2 wherein said receptor site is selected from the group consisting of oligosaccharide recognition receptors and peptide sequence recognition receptors.
- 4) The process of claim 3 wherein said receptor site is a mannose receptor site.
- 5) The process of claim 2 wherein said lipid hydrolyzing protein or polypeptide is the protein lysosomal acid lipase.
- 6) The process of claim 2 wherein said lipid hydrolyzing protein or polypeptide is a protein which shows at least 85% sequence homology to the protein lysosomal acid lipase.
- 7) The process of claim 2 wherein said lipid hydrolyzing protein or polypeptide is a polypeptide possessing similar biological activity as lysosomal acid lipase.

8) The process of claim 2 wherein said lipid hydrolyzing protein or polypeptide is a protein having a Ser¹⁵³ residue.

9) The process of claim 2 wherein said lipid hydrolyzing protein or polypeptide is a polymorphic variant protein of lysosomal acid lipase with substitution of amino acid Pro(-6) to Thr and Gly2 to Arg.

10) The process of claim 5 wherein the lysosomal acid lipase has fewer than six N-linked acetylglycosylation residues.

11) The process of claim 5 wherein the lysosomal acid lipase has more than six N-linked acetylglycosylation residues.

12) The process of claim 10 wherein the N-acetylglycosylation residue is oligosaccharide-terminated.

13) The process of claim 12 wherein the oligosaccharide terminating residue is a mannose residue.

14) The process of claim 11 wherein the N-acetylglycosylation residue is oligosaccharide-terminated.

15) The process of claim 14 wherein the oligosaccharide terminating residue is a mannose residue.

16) The process of claims 5, 6, 7, 8 or 9 wherein the lipid hydrolyzing protein or polypeptide is exogenously produced.

17) The process of claim 16 wherein said lipid hydrolyzing protein or polypeptide is in a pharmaceutically acceptable carrier and is administered either orally, parenterally, by injection, intravenous infusion, inhalation, controlled dosage release or by intraperitoneal administration.

18) The process of claims 17 wherein said lipid hydrolyzing protein or polypeptide is administered by intravenous infusion.

19) A method for treatment of atherosclerosis in a mammal comprising administering to said mammal a safe and effective amount of a lipid hydrolyzing protein or polypeptide, or mixtures thereof, sufficient to treat said condition.

20) The method of claim 19 wherein said lipid hydrolyzing protein or polypeptide targets a receptor site for uptake into lysosomes.

21) The method of claim 20 wherein said receptor site is selected from the group consisting of oligosaccharide recognition receptors and peptide sequence recognition receptors.

- 22) The method of claim 21 wherein said receptor site is a mannose receptor site.
- 23) The method of claim 20 wherein said lipid hydrolyzing protein or polypeptide is the protein lysosomal acid lipase.
- 24) The method of claim 20 wherein said lipid hydrolyzing protein or polypeptide is a protein which shows at least 85% sequence homology to the protein lysosomal acid lipase.
- 25) The method of claim 20 wherein said lipid hydrolyzing protein or polypeptide is a polypeptide possessing similar biological activity as lysosomal acid lipase.
- 26) The method of claim 20 wherein said lipid hydrolyzing protein or polypeptide is a protein having a Ser¹⁵³ residue.
- 27) The method of claim 20 wherein said lipid hydrolyzing protein or polypeptide is a polymorphic variant protein of lysosomal acid lipase with substitution of amino acid Pro(-6) to Thr and Gly2 to Arg.
- 28) The method of claim 23 wherein the lysosomal acid lipase has fewer than six N-linked acetylglycosylation residues.

29) The method of claim 23 wherein the lysosomal acid lipase has more than six N-linked acetylglucosylation residues.

30) The method of claim 28 wherein the N-acetylglycosylation residue is oligosaccharide-terminated.

31) The method of claim 30 wherein the oligosaccharide terminating residue is a mannose residue.

32) The method of claim 29 wherein the N-acetylglycosylation residue is oligosaccharide-terminated.

33) The method of claim 32 wherein the oligosaccharide terminating residue is a mannose residue.

34) The method of claims 23, 24, 25, 26 or 27 wherein the lipid hydrolyzing protein or polypeptide is exogenously produced.

35) The method of claims 34 wherein said lipid hydrolyzing protein or polypeptide is in a pharmaceutically acceptable carrier and is administered either orally, parenterally, by injection, intravenous infusion, inhalation, controlled dosage release or by intraperitoneal administration

36) The method of claims 35 wherein the lipid hydrolyzing protein or polypeptide is administered by intravenous infusion.

37) A composition comprising a safe and effective amount of a lipid hydrolyzing protein or polypeptide and a pharmaceutically acceptable carrier.

38) The composition of claim 37 wherein the lipid hydrolyzing protein or polypeptide is the protein lysosomal acid lipase.

39) The composition of claim 37 wherein the lipid hydrolyzing protein or polypeptide is a protein showing at least 85% sequence homology to lysosomal acid lipase.

40) The composition of claim 37 wherein said lipid hydrolyzing protein or polypeptide is a polypeptide possessing similar biological activity as lysosomal acid lipase.

41) The composition of claim 37 wherein said lipid hydrolyzing protein or polypeptide is a protein having a Ser¹⁵³ residue.

42) The composition of claim 37 wherein said lipid hydrolyzing protein or polypeptide is a polymorphic variant protein of lysosomal acid lipase with substitution of amino acid Pro(-6) to Thr and Gly2 to Arg.

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43) The composition of claim 38 wherein the lysosomal acid lipase has fewer than six N-linked acetylglycosylation residues.

44) The composition of claim 38 wherein the lysosomal acid lipase has more than six N-linked acetylglycosylation residues.

45) The composition of claim 43 wherein the N-acetylglycosylation residue is oligosaccharide-terminated.

46) The composition of claim 45 wherein the oligosaccharide terminating residue is a mannose residue.

47) The composition of claim 44 wherein the N-acetylglycosylation residue is oligosaccharide-terminated.

48) The composition of claim 47 wherein the oligosaccharide terminating residue is a mannose residue.

49) A composition comprising a safe and effective amount of lysosomal acid lipase in a pharmaceutically acceptable carrier.

50) A composition comprising a safe and effective amount of a lipid hydrolyzing protein showing at least 85% sequence homology to lysosomal acid lipase in a pharmaceutically acceptable carrier.

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51) A method for providing biologically active lipid hydrolyzing protein or polypeptide, or mixtures thereof, to cells of a mammal having deficiency in biologically active lipid hydrolyzing protein or polypeptide, said method comprising administration into cells a vector comprising and expressing a DNA sequence encoding biologically active lipid hydrolyzing protein or polypeptide, and expressing the DNA sequence in said cells to produce biologically active lipid hydrolyzing protein or polypeptide.

52) The method of claim 51 wherein the cells harboring the vector secrete the biologically active lipid hydrolyzing protein or polypeptide which is taken up by other cells deficient in the lipid hydrolyzing protein or polypeptide.

53) The method of claim 51 wherein the biologically active human lipid hydrolyzing protein or polypeptide is lysosomal acid lipase.

54) The method of claim 51 wherein the biologically active human lipid hydrolyzing protein or polypeptide is a protein having at least 85% sequence homology to lysosomal acid lipase.

55) The method of claim 51 wherein the biologically active human lipid hydrolyzing protein or polypeptide is a polymorphic variant protein of lysosomal acid lipase with substitution of amino acid Pro(-6) to Thr and Gly2 to Arg.

56) A method for providing biologically active lysosomal acid lipase to cells of a mammal having deficiency in biologically active lysosomal acid lipase, said method comprising administration into cells a vector comprising and expressing a DNA sequence encoding biologically active lysosomal acid lipase and expressing the DNA sequence in said cells to produce biologically active lysosomal acid lipase.

57) The method of claim 56 wherein the cells harboring the vector secrete biologically active lysosomal acid lipase which is taken up by other cells deficient in lysosomal acid lipase.

Dent B2 58) The method of claim 56 wherein the vector is a viral vector.

59) The method of claim 58 wherein the viral vector is selected from the group consisting of a lentivirus, adenovirus, adeno-associated virus and virus-like vectors.

Dent B3 60) The method of claim 56 wherein the vector is a plasmid.

61) The method of claim 56 wherein the vector is a lipid vesicle.

62) A method for providing biologically active lysosomal acid lipase to cells of a mammal with atherosclerosis, comprising administration into the cells of said mammal an amount of a vector comprising and expressing a DNA sequence

5 encoding lysosomal acid lipase and which is effective to transfect and sustain expression of biologically active lysosomal acid lipase in cells deficient therein.

63) The method of claim 62 wherein the expressed lysosomal acid lipase is secreted from the infected cells and is taken up by other cells deficient therein.

64) A method for treatment of Wolman's Disease in a mammal comprising administering to said mammal a safe and effective amount of lysosomal acid lipase sufficient to treat said condition.

65) A method for treatment of Cholesteryl Ester Storage Disease in a mammal comprising administering to said mammal a safe and effective amount of lysosomal acid lipase sufficient to treat said condition.

66) A method for treatment of atherosclerosis in a mammal comprising administering to said mammal a safe and effective amount of exogenously produced lysosomal acid lipase sufficient to treat said condition.

67) The method of claim 66 wherein the lysosomal acid lipase is in a suitable pharmaceutically acceptable carrier.

68) The method of claim 67 wherein the lysosomal acid lipase is administered by intravenous infusion.